Updated Policy and Procedures Manual

for the

Preventative/UST Unit
Storage Tank Section

April 25, 2003

Bureau of Environmental Remediation
Kansas Department of Health and Environment
1000 SW Jackson, Suite 410
Topeka, KS 6612-1367

Table of Contents

I. Introduction.

The intent of the Updated Policy and Procedures Manual is two fold:

- Notify Kansas-Licensed UST Contractors and Tightness Testers of KDHE's expectations, and
- Aid the daily administration of the Preventative/UST Unit.

The mission of the Preventative/UST Unit is to prevent the release of regulated substances from underground storage tanks thereby protecting the health and safety of Kansans and protecting the soil and ground water resources of Kansas from contamination caused by releases from these storage tanks. KDHE and the Kansas-Licensed Contractors are engaged in a partnership to meet the above goal. Underground storage tank owner/operators also are a critical member of this partnership. Subsequent updates to this Policy and Procedures manual will address their contribution, as well.

This update will cover the: 1) Application Process for new installations, upgrades, and repairs of regulated underground storage tank systems, 2) details concerning the installation of underground storage tank systems, and 3) policy updates and procedures for corrosion protection. The first section gives information on proper forms to submit for underground storage tank work, when to submit them, other documentation that may be required for approval, and when to submit verification of completion. Information on activities that may lead to enforcement action by KDHE is also included. The section, "Installation of New Underground Storage Tank Systems" details KDHE's requirement of tank and line tightness tests prior to operation and introduces the use of UST Construction permits. The section, "Corrosion Protection Policy", supersedes policies of December 1996, and details the forms and when to submit these for work with sacrificial anode and impressed current corrosion protection systems. This section also details other documentation that may be required for approval, the KDHE approval process, and when to submit verification of completion forms. This section also details KDHE requirements for corrosion protection tests and corrosion protection testers. Finally, this section details the KDHE requirements for the installation of internal linings of underground storage tanks, inspections of internal linings, and repairs to these.

The Kansas Department of Health and Environment formally adopts the following standards with this policy manual: American Petroleum Institute (API) Recommended Practice 1615 (1996) and Petroleum Equipment Institute (PEI/RP 100-2000, 2000) with an emphasis on tank and line tightness testing prior to operation; ASTM G158-98 for the assessment of buried steel tanks; National Association of Corrosion Engineers (NACE) Standard TM0101-2001 for the corrosion protection testing of underground storage tank systems; NACE Standard RP0285 for the interpretation of corrosion protection test results; and API Standard 1631 (Fifth Edition, June 2001) for the installation, inspection, and repairs made to internally-lined underground storage tanks.

II. Applications for New Installations, Upgrades, and Repairs to Underground Storage Tanks.

A. Application Process. K.A.R. 28-44–15 requires that individuals who install, modify, or repair underground storage tanks must obtain a permit from the Kansas Department of Health and Environment. The individuals performing such work on underground storage tank must be licensed, and the companies they work for also must be licensed with the State of Kansas (K.S.A. 65-34,110 (a)). Specifically, these workers must hold a current Individual Installer License and meet the requirements of K.A.R. 28-44-21. The company these individuals work for also must be licensed in accordance with K.A.R. 28-44-20, except if an employee only services underground storage tank systems belonging to his or her employer, the owner of the underground storage tanks in question. For example, KDHE will not require the company, Gas-A-Trip, INC (Owner ID 00999) to carry a Contractor Company License if these individuals will only work on UST systems owned by Gas-A-Trip, INC.

The application process consists of three steps:

- **Submittal.**
- **Approval.**
- **Verification.**

1. Submittal. The Application process starts when the Licensed UST Contractor submits a New Underground Storage Tank System Installation Application (UST006), a UST Upgrade/Modification Application (UST012), or a UST Repair Notification (UST009), to the Kansas Department of Health and Environment. KDHE must receive the $20.00 per tank application fee and the Installation Application (UST006) ten working days prior to the scheduled installation of underground storage tanks in the tank excavation. The individual completing the Installation Application (UST006) should be a Kansas-licensed Installer.

Licensed UST Contractors must submit the Upgrade/Modification (UST012) or Repair Notification (UST009) forms to notify KDHE of any work with the underground storage tank system that affects the following:

- underground parts of the system that routinely contain product,
- components installed to make the system compliant with 1998 standards (tank and/or line corrosion protection, spill prevention, overfill prevention),
- tank and line release detection

In addition to the above, KDHE recommends that UST Contractors submit an

Upgrade/Modification (UST012) or a Repair Notification (UST009) form to cover work involving flex connector corrosion protection and secondary containment for submersible pumps and product dispensers for database tracking purposes. The presence or lack of flex connector corrosion protection and secondary containment for dispensers and submersible pumps will have no bearing on the underground storage tank permitting process. KDHE must receive the Upgrade/Modification (UST012) form 10 working days prior to the scheduled date for starting any of the work listed above. The individual completing the Upgrade/Modification (UST012) form should be a Kansas-licensed Installer.

Licensed UST Contractors may submit the Repair Notification (UST009) forms up to 30 days following the completion of the work provided that they notify KDHE within 24 hours that the work must be performed to protect public health and environment from a release, or to repair failed corrosion protection systems. Contractors also should use the Repair Notification (UST009) forms to cover "in kind" replacements of failed components for underground storage tank systems. The individual completing the Repair Notification (UST009) form should be a Kansas-licensed Installer.

Although K.A.R. 28-44-15 (d) requires the submission of as built drawings within 30 days of completion of underground storage tank work, Licensed UST Contractors should submit such drawings with the Installation Application (UST006), Repair Notification (UST009), and the Upgrade/Modification (UST012) forms for the following:

- new underground storage tank installations,
- replacement/relocation of product lines or replacement/relocation of dispensers during upgrades,
- addition/replacement of anodes or wires for corrosion protection systems,
- installation of entire corrosion protection systems, or
- changes departing from previously approved applications (KDHE also must approve such changes).

2. Approval. As part of the approval process, the Kansas Department of Health and Environment evaluates whether or not the proposed scope of the work and the equipment listed on Installation Application (UST006), Repair Notification (UST009), or the Upgrade/Modification (UST012) forms meet State and Federal requirements for underground storage tank systems. KDHE does reserve the right to request additional information, in writing when necessary, if the information provided on these forms is incomplete, or more information is needed to clarify the scope of work being performed on the underground storage tank system. KDHE may withhold approval until all requested information or documentation is received from the Licensed UST Contractor. Normally, KDHE will review, approve, and send approval packets to the contractor, underground storage tank owner, and if necessary, the operator, within 10 working days after receipt provided that the applications are completed to meet the requirements of KDHE.

The approval packet consists of an approval letter, a copy of the approved application, and other required forms and is sent to the UST owner and Kansas-licensed UST contractor completing the work. Approval packets for new installations sent to contractors will include an Installation Permit, The Kansas Registration Notification with Compliance Verification for Underground Storage Tanks (UST007), Underground Storage Tank System Tightness Test (UST011), and the Sacrificial Anode Cathodic Protection Certification (UST010) form if Sti-P3 USTs are to be installed. KDHE will forward copies of the approval letter, approved application, and installation permits to the UST owner/operator and the appropriate KDHE District Office. Overall, contractors must receive written or approval by fax or mail before they install the underground storage tank(s) in the excavation.

Approval packets for upgrades, modifications, or repairs to underground storage tank systems will include the Underground Storage Tank Compliance Verification (UST 004) form, and depending on the type of work being completed, one or more of the following forms: Tightness Test (UST011), Sacrificial Anode Certification (UST010), or Underground Storage Tank System Impressed Current Cathodic Protection Certification (UST005). Contractors must receive their approval packet before they begin upgrade or modification work with underground storage tank systems.

K.A.R. 28-44-15 (c) requires that Kansas Licensed UST Contractors notify and obtain approval from KDHE by fax or in writing if any changes to underground storage tank installations or upgrades occur after Contractors receive initial approval. The Contractor should submit modified plans/documents incorporating proposed changes for KDHE approval when the need for changes becomes apparent after beginning work at the facility.

Licensed UST Contractors have up to 120 days from the date of KDHE approval on the application to complete the work they have applied for with Installation Application (UST006) or Upgrade/Modification (UST012) forms. After 120 days, previously approved applications become null and void if the UST Contractor has not advised KDHE of the status of the underground storage tank work. Licensed-UST Contractors should keep KDHE advised of the progress of any underground storage tank work especially when circumstances beyond the control of the UST Contractor cause delays.

If work has not been performed within 120 days from the approval date on the application, KDHE will require re-submission of Installation Application (UST006) or the Upgrade/Modification (UST012) forms. An application fee of $20.00 per tank must also accompany the second and any subsequent submission of the Installation Application (UST006). Otherwise, UST Contractors should inform KDHE in writing if they have cancelled work they have applied for with Installation Application (UST006) or Upgrade/Modification (UST012) forms.

3.Verification. K.A.R. 28-44-15 (d) requires that Licensed UST Contractors submit as built drawings to document details of the new underground storage tank installation, or modifications or repairs to existing underground storage tank systems within 30 days of the completion of work. KDHE will accept submission of the Underground Storage Tank Compliance Verification (UST004) form to document the completion of work covered in previously approved Repair Notifications (UST009) or Upgrade/Modification (UST012) forms. As built drawings should accompany the Compliance Verification form (UST004) when needed to document any KDHE-approved changes to previously submitted applications. The individual completing the Compliance Verification (UST004) form should be a Kansas-Licensed UST installer.

Additionally, Tightness Test (UST011) results should accompany the Compliance Verification (UST004) forms when tightness testing resulted from the following:

- New UST installations;
- Installation of or repairs to tank internal linings;
- Repairs to tanks and product lines following failed tightness tests; and/or
- Replacement, modifications, or repairs to product lines.

Kansas-licensed tightness testers must submit Tightness Test (UST011) results to KDHE within 30 days of performing these tests.

The Impressed Current Certification (UST005) should accompany the Compliance Verification (UST004) form when corrosion protection testing resulted from the installation, replacement, or repairs to impressed current corrosion protection systems. The Sacrificial Anode Certification (UST010) should accompany the Compliance Verification (UST004) form when corrosion protection tests result from the Installation, replacement, or repairs to sacrificial anode corrosion protection systems.

B. Enforcement.

1. Application Process. KDHE may initiate administrative actions against Kansas - Licensed UST Contractors and Individual Installers upon discovery of the following circumstances:

- performing work on UST Systems without a License or with an expired License,
- installing a UST system without receiving written approval from KDHE,
- working on UST Systems without receiving written approval from the KDHE, or
- failing to have a licensed UST installer on site at least 75% of the time.

K.S.A. 65-34,106 (a) states that "No person shall construct, install, modify, or operate a storage tank unless a permit or other approval is obtained from the secretary." The Kansas Department of Health and Environment considers the construction, installation, and modification of underground storage tank systems to be a unlawful act if approval is not received from the KDHE (K.S.A. 65-34,109 (a) (2)). Both the contractors and individuals performing the work mentioned above on underground storage tank systems also must be licensed with KDHE to do such work (K.S.A. 65-34,110 (a)). Licensed contractors failing to obtain an approved application for installation or modification of underground storage tank systems, and those contractors and individuals working on these systems without licenses may be subject to administrative action and fines up to $10,000 per occurrence or up to $10,000 per day if the violation continues (K.S.A. 65-34,113 (a)).

UST contractors that complete underground storage tank work without seeking approval from KDHE will receive certified Warning Letters from KDHE. Copies of these letters become part of the record in KDHE's Contractor files. Administrative Orders may result from subsequent offenses. The Kansas Department of Health and Environment may waive the Warning Letter if multiple violations by a single UST contractor are documented. Additionally, licensed contractors and installers that fail to comply with conditions of the license or comply with any requirement or provision of this act may be faced with the possible denial, suspension, or revocation of their licenses under K.S.A. 65-34,111 (b) after a hearing is administered in accordance with the Kansas Administrative Procedures Act.

2. Verification Process. Licensed UST contractors will receive certified letters when the Kansas Department of Health and Environment has not received Compliance Verification (UST004 or page 2 UST007,) forms or explanations for work not performed due to cancellation as follows:

- 120 days after Agency approval of the Installation Application (UST006) or Upgrade Modification (UST012) and/or
- 30 days after completion of the Installation Application (UST006), Upgrade Modification (UST012), or Repair Notification (UST009).

Copies of these certified letters will be placed in Agency files. These certified letters will give Licensed UST Contractors a 30-day deadline to submit the requested documentation. Licensed UST contractors failing to submit the above referenced documentation required under K.A.R. 28-44-15 (d) within 30 days of the date on the certified letter may be faced with the possible denial, suspension, or revocation of their licenses under K.S.A. 65-34,111 (b) after a hearing is administered in accordance with the Kansas Administrative Procedures Act.

III. Installation of New Underground Storage Tank Systems

A. Documentation of tank and line tightness prior to operation.

1. Requirements. K.A.R. 28-44-16 (a) (40 CFR 280.20 (d)) requires that "All tanks and piping must be properly installed in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and in accordance with the manufacturer's instructions." Both the American Petroleum Institute (API Recommended Practice 1615, 1996, p. 40) and Petroleum Equipment Institute (PEI/RP 100-2000, 2000, Table 2., p. 26) require precision (0.1 gph) tank tightness tests and precision (0.1 gph) line tightness tests of pressurized and conventional suction product lines prior to bringing newly installed underground storage tank systems into operation. Accordingly, the Kansas Department of Health and Environment requires precision tank testing and precision testing of conventional suction and pressurized product lines of newly installed underground storage tank systems prior to placing these systems in operation. The following are the acceptable substitutes for tank and line tightness testing prior to operation:

- an automatic tank gauge 0.1 gph leak test (3rd party certified) performed on the tank as full as the overfill equipment will allow (90-95% capacity);
- documentation of vacuum and liquid levels in interstitial spaces of double wall USTs before and after installation;
- automatic tank gauge tapes or other showing the results of 0.1 gph precision line tests performed with (3rd party certified) automatic line monitors.

Licensed UST Tightness Testers should use Tightness Test (UST011) form to report the results of tightness tests to KDHE.

2. Background. Item "K" of the Installation Application (UST006) has always stated, "A volumetric tightness test is required at the time of installation prior to operation to insure the system is tight." The Kansas Department of Health and Environment has accepted printouts from automatic tank gauges and automatic line monitors to document tank and line tightness provided that they were submitted by a tester licensed by KDHE. KDHE accepted these printouts with the understanding that the Kansas-Licensed Tightness Tester would operate the release detection equipment to yield precision 0.1 gph tank and line tests according to the equipment manufacturer's 3rd Party Certification. In practice, some UST installers have provided printouts of automatic tank gauge 0.2 gph leak tests or 0.1 gph leak tests at less than 90-95 capacity and that did not meet the manufacture's 3rd Party Certifications for a precision test; others did not submit any release detection information.

Starting in October 2001, the Kansas Department of Health and Environment revised the approval letters sent to contractors to outline what the contractors and owner/operators needed to submit to the KDHE to receive operating permits for newly installed underground storage tank

systems. Specifically, the KDHE requested the documentation mentioned in Item K of the Installation Application:

- "Submitting release detection information: tank and line tightness test results or automatic tank gauge printouts. Use the **"Underground Storage Tank System Tightness Test"** form for reporting results of tightness tests.

No newly installed underground storage tank system (including non-standby, standby heating oil, and back-up electrical generator) will be issued an operating permit until the Agency receives acceptable documentation of tank and line tightness results. Licensed UST Contractors failing to provide documentation of tightness testing prior to operation may be faced with the possible denial, suspension, or revocation of their licenses under K.S.A. 65-34,111 (b) after a hearing administered in accordance with the Kansas Administrative Procedures Act.

B. UST Installation and Temporary Operating Permits. Starting May 31, 2003, the Kansas Department of Health and Environment will no longer issue Temporary Operating Permits to owner/operators of new underground storage tanks upon approval of Installation Application (UST006) forms. Instead, KDHE will issue Installation Permits to the contractor good for 120 days after the date of approval. The Installation Permit authorizes a one-time drop of fuel for tank and line tightness testing only. However, such Installation Permits will not allow the UST owner/operator to operate their newly installed tanks.

KDHE will issue 120-Day Temporary Operating Permits to the owner/operator after the following documentation is received:

- the completed Kansas Registration Notification for Underground Storage Tanks (UST007) form (page 1);
- the completed Kansas Registration Notification Page 2 - Compliance Verification Information (page 2);
- documentation of financial responsibility for compensating third parties for bodily injury and property damage arising from releases from UST systems;
- passing tank and line tightness tests documented on the Tightness Test (UST011) form and signed by the licensed tightness tester,
- passing corrosion protection test results (for metallic tanks and/or product lines) documented on the Sacrificial Anode Certification (UST010) form, signed by the corrosion protection tester.

Information on performing inventory control will accompany the 120-Day Temporary Operating Permit. The Kansas Department of Health and Environment also will supply Release Detection 90-Day Summary Sheets to those owner/operators who have adopted a monthly monitoring method of release detection. UST Operating Permits (printed on safety paper) will be issued after the receipt of satisfactory inventory control records documenting the first 30 days of

operation and satisfactory 90-Day Release Detection Summary Sheets. Both the inventory control records and the Release Detection Summary Sheets must be filled out correctly as required by KDHE underground storage tank regulations.

IV. Corrosion Protection Policy.

A. Impressed Current and Sacrificial Anode Systems.

1. Repairs and Two Cases of Upgrades/Modifications.

The addition of a cathodic protection systems, either sacrificial anode or impressed current, is one means to meet the corrosion prevention requirement (K.A.R. 28-44-16 (40 CFR 280.21) (b)). The addition of cathodic protection systems, especially impressed current systems, can hasten tank failure in structurally unsound tanks; therefore, KDHE requires that the tank's structural integrity be assessed before impressed current or galvanic systems are added (K.A.R. 28-44-16 (40 CFR 280.21) (b) (2)).

Owner/operators must submit satisfactory release detection information prior to the addition of corrosion protection to underground storage tank systems, the repair of existing corrosion protection systems, the conversion of sacrificial anode to impressed current systems, or the replacement of older corrosion protection systems with newer ones. The review of "Passing" release detection information will function as the assessment of tank structural integrity for the conversion of sacrificial anode to impressed current systems, the replacement of impressed current systems with new ones (previous integrity assessment can be found in Agency files), and unprotected steel tanks less than 10 years old. Release detection information acceptable for review includes the following:

- **Release detection reports for 3 months prior to the upgrade or repair work.** Ideally, release detection reports like automatic tank gauge printouts should show the tank at its fullest capacity for at least one of the reports, ***or***
- **Copy of tank and/or line tightness test within last 12 months prior to the upgrade or repair work.** Tightness test results also will be acceptable if the owner/operators fail to find previous release detection reports. Additionally, owner/operators using 5-year tank tightness testing and inventory control as their method of release detection must have their underground storage tanks tested for tightness prior to the upgrade or repair work, ***or have at least,***
- **Copies of 3 months of satisfactory monthly inventory records prior to the upgrade or repair work.** Such inventory records must be properly reconciled and show passing leak test calculations.

KDHE-Licensed Tightness Testers should be the individuals filling out Tightness Test (UST011) forms. Incomplete forms are not acceptable and may be sent back.

a. Repairs to Existing Corrosion Protection Systems.

In addition to the release detection information mentioned above, the Kansas-licensed UST Contractor must submit the UST Repair Notification (UST009) and a site plan showing the locations of the new anodes and leads, as well as existing system components. Licensed UST Contractors may submit the Repair Notification (UST009) forms up to 30 days following the completion of the work provided that they notify KDHE within 24 hours that the work must be to repair failed corrosion protection systems. KDHE will accept Repair Notifications (UST009) forms under the following circumstances:

- **Repair of sacrificial anode and impressed current corrosion protection systems through the addition of anodes to existing systems.**
- **Repair of cut cables.**
- **Replacement in kind of rectifiers on impressed current corrosion protection systems.**

The Kansas-Licensed UST Contractor must submit the Compliance Verification (UST004) form, passing corrosion protection test results on either the Impressed Current Certification (UST005) or the Sacrificial Anode Certification (UST010), and a site plan to document completion of the repair work. KDHE should receive the documentation listed above no later than 30 days after completion of the repair or 30 days after the approval of the repair, whichever comes first.

b. Upgrades/Modifications–Case One.

Under the following circumstances, the Kansas-licensed UST contractor must submit the Upgrade/Modification Application (UST012) and the Kansas Cathodic Protection Review Forms (UST014) ten days prior to the scheduled date of starting the work:

- **Conversion of tanks protected by sacrificial anodes to impressed current systems.**
- **Replacement of failed impressed current systems for which documentation of the required tank integrity assessment can be found in Agency Files.**
- **Unprotected steel tanks less than ten years old.**

The Agency will require no assessments under ASTM G158-98 for conversions of sacrificial anode to impressed current systems or for unprotected steel underground storage tanks less than 10 years old.

Critical items of interest on the Review Form (UST014) include measurement of the soil resistivity, measurements of electrical continuity or isolation, stray current data, structure to soil potentials, and manufacturer/model/capacity information on the rectifier and anodes. Cathodic protection systems must be designed in accordance with industry standards and meet the minimum requirements of 40 CFR 280. The cathodic protection systems must be designed by a NACE-certified corrosion expert or a Kansas-licensed professional engineer with corrosion experience. Both must meet the qualifications as defined in K.A..R. 28-44-14 (d) (40 CFR

280.12). The corrosion experts/professional engineer also must certify the design meets the minimum standards of 40 CFR 280. Therefore, KDHE requires that the following language be used for the signed/sealed certification statement listed on the UST001 and 014 Review Forms:

I certify that, as a qualified Corrosion Expert (as defined in EPA Underground Storage Tank Rules; 40 CFR Part 280), assessments, recommendations, designs and evaluations for the system at _____ *have been made in accordance with applicable law, accepted standards and in keeping with the best interests of public human health and protection of the environment to prevent release due to corrosion deterioration.*

Date_____20_____ _____Cert. No._____

P.E. or NACE certified Corrosion Specialist/Cathodic Protection Specialist

Seal

The corrosion protection system must be installed by a Kansas-Licenced Installer. The Installer is responsible for making sure that the items on the Review Forms (UST014) are submitted with the Upgrade/Modification Application (UST012) . If some of the items on the checklist do not apply to a particular assessment methodology, they may be omitted with explanations. If the upgrade application is complete and meets KDHE requirements, an approval (valid for 120 days) is given to install the CP system. If the installation is not made within 120 days, the contractor must submit a written request for an extension or resubmit an installation application. In both cases, the contractor must provide data to show the tanks are still structurally sound and have not developed leaks during the intervening time. Kansas Licensed UST installers should keep KDHE aware of changes to site designs caused by differing field conditions encountered during the installation of the corrosion protection system. All design changes must be first approved by the corrosion protection expert who originally designed the system. The Installer may fax a new corrosion protection design and explanation of the changes to secure approval of such design changes from KDHE.

The Kansas-Licensed UST Contractor must submit the Compliance Verification (UST004) form and passing corrosion protection test results on either the Impressed Current Certification (UST005) or the Sacrificial Anode Certification (UST010), and a site plan to document completion of the upgrade/modification work. KDHE should receive the documentation listed above no later than 30 days after completion of this work.

c. Upgrades/Modifications–Case Two.

KDHE will require the Kansas-Licensed UST Contractor to submit the Upgrade/Modification Application (UST 012), Kansas Cathodic Protection Review Form (UST 001), and the Certification of Tank Integrity (UST 002) under the following circumstances, 10 days prior to the scheduled date for starting work:

‘ **Replacement of failed impressed current systems for which the Agency lacks**

documentation of the required integrity assessment.
- **Internally-lined steel tanks that lack external corrosion protection.**
- **Unprotected Steel Tanks ten years old and older.**

KDHE will require assessments of the structural integrity of steel underground storage tanks performed to the standards of ASTM G158-98 for each of the above cases. ASTM G158-98 covers three options for the assessment of buried steel tanks:

- "**Method A** -- Noninvasive with primary emphasis on statistical and electrochemical analysis of external site environment corrosion data."
- "**Method B** – Invasive ultrasound thickness testing with external corrosion evaluation."
- "**Method C** – Invasive permanently recorded visual inspection and evaluation including external corrosion assessment."

UST owner/operators who chose Method A for the assessment of their buried steel tanks during the corrosion protection upgrade must use a monthly monitoring method of release detection after the upgrade because this method does not involve an invasive inspection of the storage tank. For Method A, a Corrosion Expert as defined in K.A..R. 28-44-14 (d) (40 CFR 280.12) must complete the Tank Integrity (UST002) form. For Methods B and C, the tank inspector must be a Kansas-licensed installer, and that person must complete the Tank Integrity (UST002) form. Prior approval is not required for tank assessments to determine if tanks are suitable for cathodic protection upgrades. KDHE will offer the information in the files to tank owners or their agents, to develop site and tank histories, if requested. Assessments of tank integrity, either by internal inspection or alternate methodology, are valid for a calendar year from the date of initial assessment. Assessments may be updated (within said calendar year) by providing current release detection documentation.

The Kansas-Licensed UST Contractor must submit the Underground Storage Tank Compliance Verification (UST004) form and passing corrosion protection test results on either the Impressed Current Certification (UST005) or the Sacrificial Anode Certification (UST010), and a site plan to document completion of the upgrade/modification work. The Agency should receive the documentation listed above no later than 30 days after completion of this work.

If, after the addition of cathodic protection, a leak in the protected tank is detected, the owner has the option to install an internal tank lining, or remove, and replace the tank. If after the addition of cathodic protection, a leaks the protected lines are detected, these must be upgraded with a non-corrodible material. Any release from underground storage tank systems must be reported to KDHE within 24 hours.

2. Corrosion Protection Testing and Performance Verification.

KDHE requires testing of impressed current and sacrificial anode corrosion protection

systems within 6 months of installation and every three years thereafter (K.A.R. 28-44-19 (40 CFR 280.31)). KDHE accepts the following credentials for corrosion protection testers:

- **current KDHE UST Installer's license and training in Cathodic Protection System Testing from a recognized institution, or**
- **current NACE certification as a Cathodic Protection System Tester and have a current KDHE UST Installer's License, or**
- **current NACE Certification as a Cathodic Protection System Tester and a current License from the Kansas Board of Technical Professions.**

Members of the last category may be issued a cathodic protection testers license at no-charge, if they submit a written request for one. KDHE prefers that individuals performing corrosion protection tests also hold a current individual UST Installers license. Overall, individuals testing corrosion protection systems in Kansas must meet the definition of "Corrosion protection tester" as stated in K.A.R. 28-44-14 (40 CFR 280.12). Such individuals must complete Underground Storage Tank System Impressed Current Cathodic Protection Certification (UST 005) or the Sacrificial Anode Cathodic Protection Certification (UST 010) forms. KDHE may return incomplete forms.

KDHE will only accept structure to soil potentials whereby the half cell (normally a saturated copper/copper sulfate reference cell) ***directly*** contacts uncontaminated soil or tank excavation fill. NACE Standard TM0101-2001 (p. 7), states "Readings shall not be taken through concrete or asphalt." Structure to soil potentials must meet one of three criteria for a "Passing" corrosion protection test as listed in NACE Standard RP0285:

- negative (cathodic) potential of at least **850 mV** with the cathodic protection applied; or
- negative polarized potential of at least **850 mV** relative to a reference cell; or
- a minimum of **100 mV** of cathodic polarization measured as the formation (system off to system on) or decay (system on to system off).

NACE Standard TM0101-2001 lists specific procedures for measuring the structure to soil potentials to determine whether or not underground storage tank systems pass corrosion protection tests based on the criteria mentioned above. Corrosion protection testers should report test results on either the Impressed Current Cathodic Protection Certification (UST005) or the Sacrificial Anode Certification (UST010) depending on the type of system being tested.

Corrosion protection testers need to completely fill out all blanks on the two reporting forms. At minimum, corrosion protection testers must provide the results of three structure to soil potential readings for each underground storage tank on the appropriate test forms. KDHE will return incomplete test forms to testers that fail to (1) completely fill in and sign the "For Tester Use Only:" box, or (2) fail to make the minimum number of structure to soil potential readings.

K.A.R. 28-44-19 (40 CFR 280.31 (c)) requires that owner/operators of underground storage tanks and product lines protected with impressed current corrosion protection systems inspect such systems every 60 days to ensure these systems are operating properly. These owner/operators should keep a written log to record the following if the rectifier is equipped to do so, at a minimum of once every 60 days:

- **voltage**
- **amps**
- **hours**
- **system "light" is on**

Owner/operators of underground storage tanks and product lines equipped with impressed current systems should ensure that the power to the rectifier stays on at all times. Specifically, owner/operators should verify the status of rectifiers following electrical storms or other events that cause disruption to electrical power supplies. Monitoring and record keeping should continue during periods when the underground storage tank system is not being used. KDHE will require passing corrosion protection tests prior to issuing permits after a change in ownership if the former owner failed to 1) maintain the 60-day rectifier log, or 2) maintain power to the rectifier even though the corrosion protection system was tested within the last three years.

3. Temporary out of Service Underground Storage Tanks.

K.A.R. 28-44-16 (40 CFR 280.70) requires that owner/operators of Temporary out of Service underground storage tanks continue with the operation and maintenance of corrosion protection. Specifically, owner/operators of underground storage tanks with sacrificial anode corrosion protection systems must continue to have these systems tested at least once every three years (K.A.R. 28-44-19 (40 CFR 280.31 (b) (1)). Corrosion protection testing will continue until the owner/operators permanently close the underground storage system in accordance with regulatory requirements.

Owner/operators of underground storage tanks with impressed current corrosion protection systems also must continue to have these systems tested at least once every three years (K.A.R. 28-44-19 (40 CFR 280.31 (b) (1)) and continue to maintain the 60-day rectifier log (K.A.R. 28-44-19 (40 CFR 280.31 (c)). Corrosion protection testing, electrical power to the rectifier, and maintenance of the 60-day rectifier log should continue until the owner/operator permanently closes the underground storage tank system in accordance with regulatory requirements.

B. Interior Lining.

1. Installation.

Interior lining of an UST provides another means of meeting the corrosion protection requirement (K.A.R. 28-44-16 (40 CFR 280.21) (b)). Tanks are to be lined in accordance with American Petroleum Institute (API) Standard 1631 (Fifth Edition, June 2001) and specific manufacturers instructions to meet KDHE requirements (K.A.R. 28-44-19 (40 CFR 280.33)). Internal linings must be compatible with product stored. Prior to the installation of a lining, the contractor initially must submit documentation to KDHE that the lining and lining installation procedures meet the technical standards outlined in the regulations or after any changes occur with these procedures of technical standards.

Lining must be performed by a Kansas-licensed UST Contractor certified to complete installations. The Kansas-licensed UST Installer must submit a Upgrade/Modification Application (UST 012) to KDHE 10 days prior to the scheduled date installation. The Upgrade Application should (1) indicate type of lining to be installed, (2) document the compatibility of the lining with the product stored in the storage tank, and (3) indicate type of tightness test to be done when lining job is completed. Approval is valid for 120 days. The Certification of Tank or Lining Integrity (UST003) must accompany the Upgrade Application. If approved work is not completed within 120 days, contractors must request an extension in writing or resubmit the lining installation application.

The contractor must submit (1) the completed API 1631–Form B (Sides 1 and 2), and (2) the completed Compliance Verification (UST014) form within 30 days of completion of the internal lining work. A tank tightness test must be performed within 30 days of the completion of the internal lining work. The Licensed UST-Tester must submit those results to KDHE within 30 days after the completion of the tests. KDHE will accept an (3rd party certified) automatic tank gauge 0.1 gph leak test performed on the tank as full as the overfill equipment will allow (90-95% capacity) in place of a tank tightness test. Holiday tests are acceptable as a substitute for a tightness test after lining has been installed. However, satisfactory monthly monitoring reports and inventory control records for three months must be submitted as a substitute for a tightness test after the performance of a satisfactory holiday test.

2. Inspection Requirements and Repairs.

Internal linings are required to be inspected within 10 years after installation and every 5 years thereafter (K.A.R. 28-44-16 (40 CFR 280.20)). Inspections must be performed by KDHE licensed installers. KDHE recommends the addition of a manway to allow for re-entry for 10 and 5 year inspections. Licensed installers completing the 10- and 5-year inspections must submit the following inspection forms to KDHE to document their work within 10 days of the completion of such inspections:

- API 1631–Form C, Tank Re-Inspection Affidavit, and
- Certification of Tank or Lining Integrity (UST003).

Owner/operators have two options if inspectors determine that the internal lining has failed. These owner/operators can either have the linings repaired to meet the standards of API Standard 1631 or have an impressed current corrosion protection system installed after the underground storage tanks pass a tank integrity assessment that meets the standards of API Standard 1631 or ASTM G158-98. The addition of impressed current corrosion protection will eliminate the need for any additional internal inspection of the underground storage tank. The addition of impressed current corrosion protection may eliminate the need for the initial 10 year internal inspection if the underground storage tank passes a tank integrity assessment that meets the standards of ASTM G158-98. However, if cathodic protection was added to a lined tank without the benefit of a structural assessment, periodic inspections of the lining are still required.

V. References.

API RP 1615, 1996, Installation of underground petroleum storage tank systems, Fifth Edition, Washington, DC: American Petroleum Institute.

API RP 1631, 2001, Interior lining and periodic inspection of underground storage tanks, Fifth Edition, Washington, DC: American Petroleum Institute.

ASTM Standard G158-98, 1998, Standard guide for three methods of assessing buried steel tanks, West Conshohocken, PA: American Society for Testing and Materials.

KDHE, 2001, Underground storage tank statutes and Regulations, Topeka, KS: Kansas Department of Health and Environment.

NACE Standard RP0285-2002, 2002, Corrosion control of underground storage tank systems by cathodic protection: Houston, TX: NACE International.

NACE Standard TM010-2001, 2001, Standard test method–Measurement techniques related to criteria for cathodic protection on underground or submerged metallic tank systems: Houston, TX, NACE International.

PEI RP100-2000, 2000, Recommended practices for installation of underground liquid storage systems, Tulsa, OK: Petroleum Equipment Institute.